

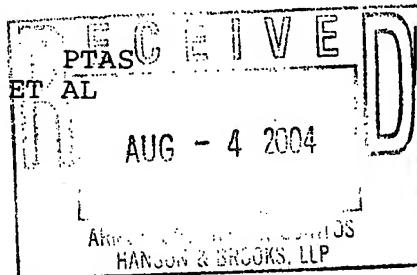


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JULY 29, 2004

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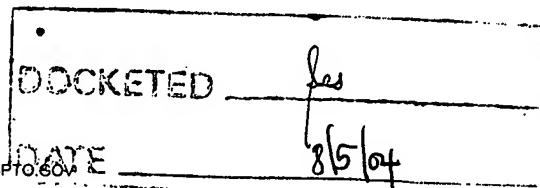
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TITLE: DATA STRUCTURE OF FEATURE GUIDANCE INFORMATION, RECORDING MEDIUM STORING FEATURE GUIDANCE INFORMATION, NAVIGATION DEVICE, NAVIGATION SYSTEM, NAVIGATION METHOD, NAVIGATION PROGRAM AND RECORDING MEDIUM STORING THE NAVIGATION PROGRAM



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22141 U.S. PTO
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Third party Name:

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Application Number(s) or Patent Number(s) Additional numbers attached? Yes No XX
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If this document is being filed together with a new application, enter the date the application was signed by the first named executing inventor: January 14, 2004

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Mel R. Quintos
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January 21, 2004 31,898
 Date Registration No.



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(12) **United States Patent**
Miyahara(10) Patent No.: **US 7,451,040 B2**
(45) Date of Patent: **Nov. 11, 2008**(54) **DATA STRUCTURE OF FEATURE GUIDANCE INFORMATION, RECORDING MEDIUM STORING FEATURE GUIDANCE INFORMATION, NAVIGATION DEVICE, NAVIGATION SYSTEM, NAVIGATION METHOD, NAVIGATION PROGRAM AND RECORDING MEDIUM STORING THE NAVIGATION PROGRAM**6,023,655 A * 2/2000 Nomura 701/208
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EP 0 790 486 A2 8/1997

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(51) **Int. Cl.**
G01C 21/26 (2006.01)(52) **U.S. Cl.** **701/200**(58) **Field of Classification Search** **701/200-226;**
340/998, 990, 995.1-995.28

See application file for complete search history.

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Primary Examiner—Rick Palabrica*Assistant Examiner*—Ari M Diacou(74) *Attorney, Agent, or Firm*—Kratz, Quintos & Hanson, LLP(57) **ABSTRACT**

A feature guidance information that provides guidance on a feature has a data structure where a unique information representing a feature position and a guidance position are associated with respective sub-areas so that each sub-area includes at most one of the feature and the guidance position to represent the feature or the guidance position. When it is recognized that a vehicle reaches a position indicated by the unique mesh information of the guidance position with respect to a current position of the vehicle, guidance on the feature corresponding to the guidance position is provided. Thus, an amount of information, load for sending/receiving data and processing can be largely decreased compared to that coordinates are used for representing the feature position and the guidance position of the feature guidance information, thereby providing smooth navigation.

6 Claims, 10 Drawing Sheets